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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/788,596	02/21/2001	Hirokazu Miyazaki	PA-1136	8771

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YOUNG & THOMPSON
745 SOUTH 23RD STREET 2ND FLOOR
ARLINGTON, VA 22202

EXAMINER

PAREKH, NITIN

ART UNIT PAPER NUMBER

2811

DATE MAILED: 07/03/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/788,596

Applicant(s)

MIYAZAKI, HIROKAZU

Examiner

Nitin Parekh

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 April 2002.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9 and 12-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9 and 12-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-7, 9 and 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyazaki et al (US Pat. 6342726).

Regarding claim 1, Miyazaki et al discloses a mounting structure of a semiconductor package comprising:

- a semiconductor chip (1 in Fig. 1-5) which is provided with a plurality of bonding pads or stud bumps/solder balls (43/45 in Fig. 44-47; Col. 21, line 45- Col. 22, line 45)
- a wiring/mounting substrate (15 in Fig. 3/4) on which the chip assembly is mounted, and
- an insulating tape/sheet/carrier having a plurality of leads (11 in Fig. 1/2) being provided between the chip and the wiring/mounting substrate (Fig. 3/4; Col. 12, line 20) wherein the plurality of bonding pads/solder balls are

electrically connected through the leads to corresponding connection pads
and external terminals (12/5 in Fig. 2)

(Fig. 1-5, 39, 44-47 and 71-75; Col. 11, 12, 20-22, 28 and 29).

Miyazaki et al disclose the conventional electrical connection of the chip and the wiring/mounting substrate but fail to specify in Fig. 3 and 4 the numerical reference of the plurality of connection pads on the wiring/mounting substrate. However, it would be obvious to one of ordinary skill in the art to realize that such connection would comprise conventional connection pads on the wiring/mounting substrate.

Regarding claim 2, Miyazaki et al further disclose the insulating tape/sheet/carrier having holes there through at positions corresponding to the connection pads (Fig. 39 and 72-75; Col. 28, line 45- Col. 29, line 45).

Regarding claims 3, 4 and 6, Miyazaki et al further disclose one end of each of the leads being fixed on a first surface of the insulating tape/sheet and electrically connected to the corresponding connection pad/external terminal while the other end being floated/S-shaped and protruded from the second surface through the corresponding hole (Fig. 1, 2, 4 and 72-75; Col. 12, line 55- Col. 13, line 5).

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Regarding claims 5, Miyazaki et al further disclose each of the bonding pads/solder balls being electrically connected to the fixed one end of the corresponding lead (Fig, 2, 44 and 47).

Regarding claim 7, Miyazaki et al further disclose the leads being formed of conventional conductive/resilient material such as copper, nickel, gold, etc. (Col. 11, line 65).

Regarding claim 9, Miyazaki et al further disclose the insulating tape/sheet being made of conventional polyimide resin but fail to specify the insulating sheet being made of any one of polyimide, epoxy, Teflon and alumina resin. However, it is conventional in the chip packaging and interconnection technology art to use the insulating tape/carrier made of material such as polyimide, epoxy, Teflon, etc.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time invention was made to incorporate the insulating sheet being made of any one of polyimide, epoxy, Teflon and alumina resin so that the desired rigidity and dielectric properties can be achieved in Miyazaki et al's structure.

Regarding claims 12-14, the claim elements have been addressed in the above rejections for claims 1-6.

3. Claim 8 is rejected under 35 U.S.C. 102(e) as being unpatentable over Miyazaki et al (US Pat. 6342726) in view of DiStefano et al (US Pat. 5518964).

Regarding claim 8, Miyazaki et al fail to specify filling the gap between the insulating tape/sheet and the wiring substrate using a resin.

DiStefano et al teach using conventional compliant material/resin (108 in Fig. 17) to fill the gap between an insulating/dielectric sheet (Col. 14, line 17-65).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time invention was made to incorporate a resin to fill the gap between the insulating sheet and the wiring substrate so that the desired sealing/protection and bonding can be achieved using DiStefano et al's resin in Miyazaki et al's structure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nitin Parekh whose telephone number is 703-305-3410. The examiner can normally be reached on 09:00AM-05:30PM.

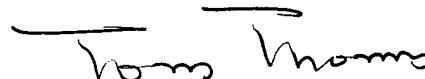
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on 703-308-2772. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7722 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-306-3431.

Nitin Parekh

NP
06-19-02



TOM THOMAS
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800